

Identification of overluminous Gaia Alerts using photo-z catalogues

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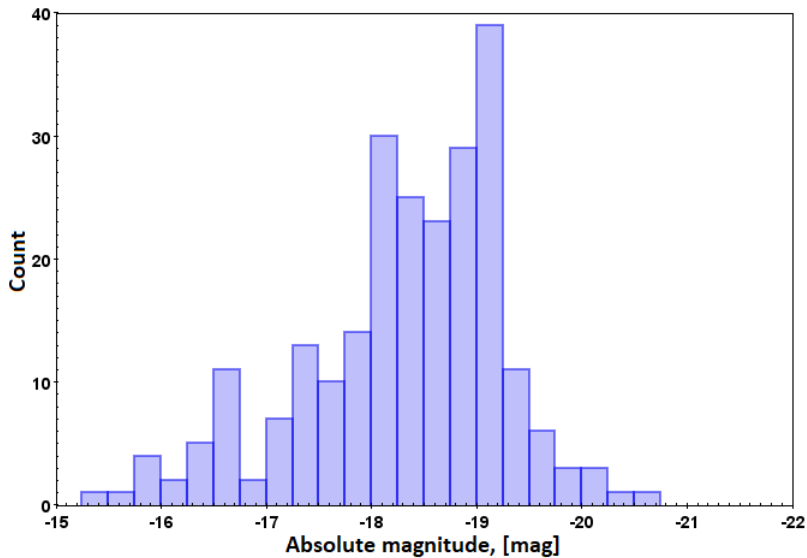
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- Spectroscopic z of galaxies often unavailable
- Photo- z – estimating redshift using photometric data
- Redshift easier to obtain at the cost of precision
- Numerous catalogues using photo- z published in recent years:
GLADE, WISExSCOSPZ, 2MPZ etc.

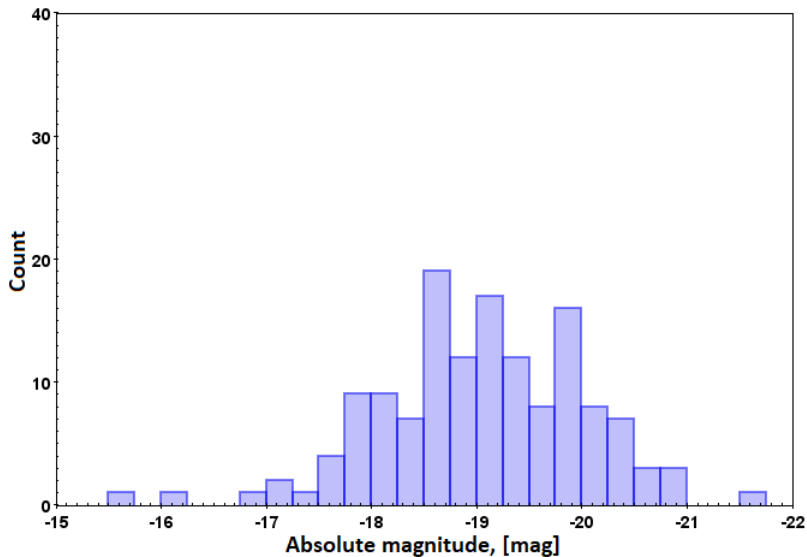
Method accuracy

Ia Supernovae – GLADE



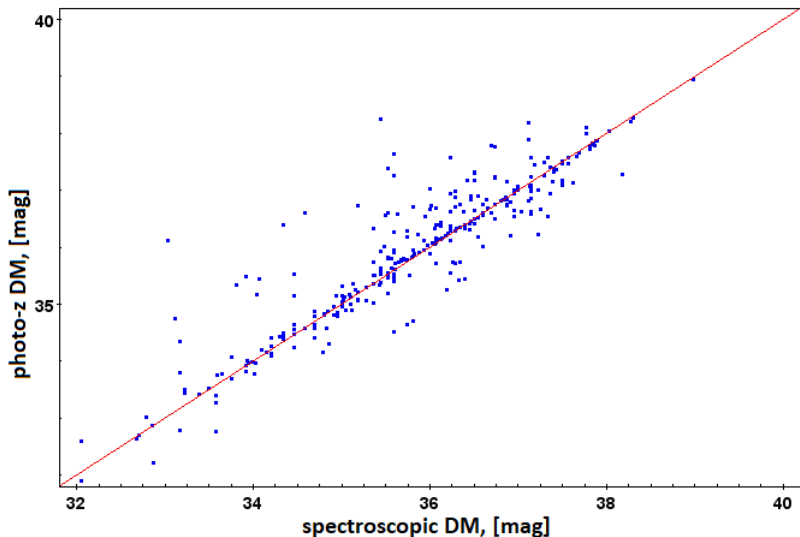
Method accuracy

Ia Supernovae – WISExSCOSPZ



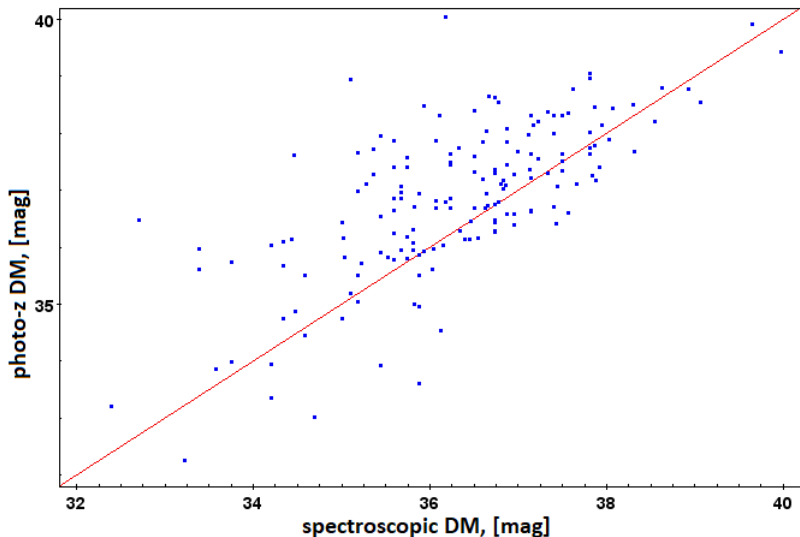
Method accuracy

Distance Moduli – GLADE



Method accuracy

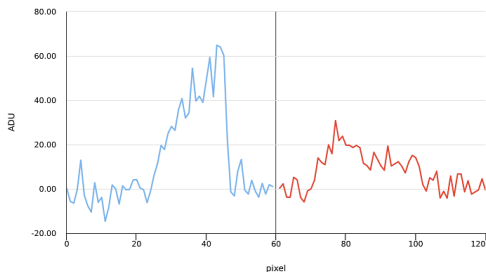
Distance Moduli – WISExSCOSPZ



Found overluminous transients

Alert	TNS ID	M [mag]	Source cat. ID	Catalogue	z	separation [as]
Gaia18afg	AT2018jb	-23.07	SDSSJ164111.74+301401.2	HyperLEDA	0.304	2.393
Gaia16bud	AT2016ggg	-21.37	3176413	HyperLEDA	0.199	1.081
		-19.95	233033401351016216	WISE	0.109	1.272
Gaia16bfc	AT2016faq	-20.30	2197525	HyperLEDA	0.121	2.172

Objects judged to be actual overluminous transients



Left: Gaia18afg position and matched galaxy; Right: alert spectrum at time of detection

Possible applications

- Preliminary classification of some alerts
- Selecting alerts for follow-up observations
- Integration into the Gaia Alerts website for convenience

- Photo-z catalogues can be used for *Gaia* Alerts to determine absolute magnitudes
- Three previously unidentified SLSNe were found
- The method can be used for preliminary alert classification & follow-up selection
- Possible implementation on the *Gaia* Alerts website